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Iowa Farmer Perception of Corn Rootworm Resistance

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Integrated Crop Management NEWS

Iowa Farmer Perception of Corn Rootworm Resistance

By Erin Hodgson, Kristine Schaefer and Aaron Gassmann, Department of Entomology

Every year Iowa State University (ISU) Extension and Outreach provides private pesticide applicator training covering a variety of pesticide safety and pest management issues. In response to reported incidences of Bt-resistant corn rootworm, a series of remote "clicker" questions were developed to survey current corn rootworm management practices and assess the degree to which farmers perceived resistance in 2012. The questions were asked at 153 pesticide applicator training sessions facilitated by extension field agronomists. More than 8,100 meeting participants responded to the six multiple-choice questions. Responses were anonymous and not everyone answered every question. Here are the statewide summaries of selected questions from the survey based on percentages of respondents:

To ascertain current management practices, participants were asked how they manage corn rootworm (Figure 1). Of the various management options for corn rootworm, 17 percent of respondents used Bt traits, 25 percent used crop rotation and 38 percent responded they used three or more methods.

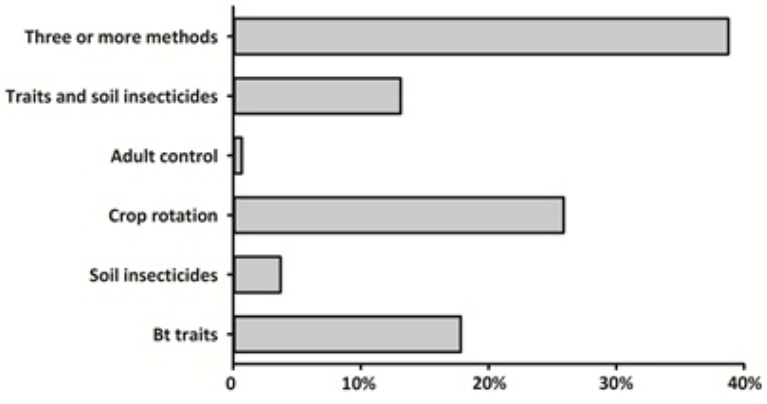

Figure 1. How do you mange corn rootworm?

When asked if they had fields in 2012 where they suspected Bt trait failure, almost one-fourth (23 percent) of participants responded "yes" and 43 percent responded that they reported the suspected failure to someone. The majority of respondents who suspected trait failure either dug and rated root injury (38 percent) or noted goosenecking/lodging symptoms (33 percent) to assess the injury (Figure 2). About 13 percent of people who suspected a Bt trait failure were able to verify the larval injury (Figure 3). Although lodging can occur as a result of rootworm feeding injury, there may be other causes such as strong wind events. The only way to verify Bt trait performance issues is to evaluate root injury. Thus the rate of verified trait failures from this survey may be overestimated because larval root injury was not confirmed for all cases.

Additionally, the level of root injury that a grower may have considered sufficiently high to warrant a trait failure is unknown. Generally, a trait failure would be considered to be present if there is one node of root injury for Bt corn with a single trait targeting rootworm and 0.5 nodes for corn that has two Bt traits targeting rootworm. A root rating scale developed by the Iowa State University Department of Entomology is available.

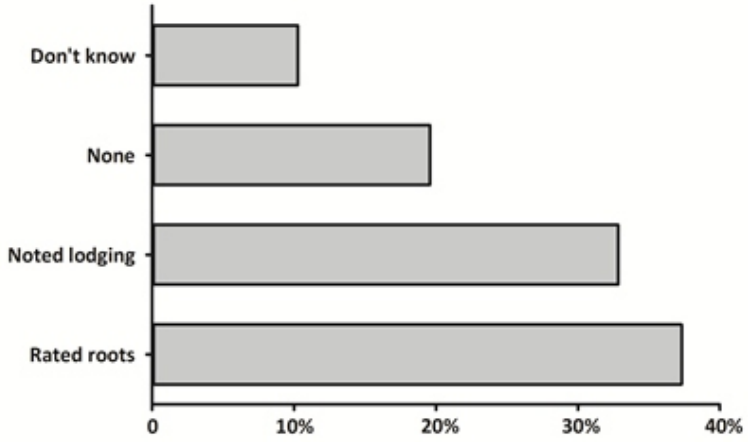

Figure 2. What method did you use to assess corn rootworm injury?

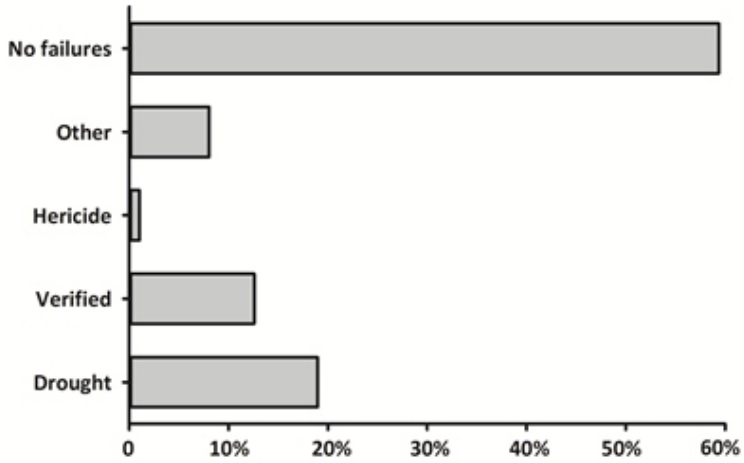

Figure 3. What was the outcome of the assessment?

To understand where most of the perceived Bt trait failures were occurring within Iowa, we grouped responses by region. About one-third of people in northeast Iowa suspected a Bt trait failure in 2012 (Figure 4). Most of the positive verifications were in north central Iowa, with approximately one-third of people reporting Bt trait failures (Figure 5).

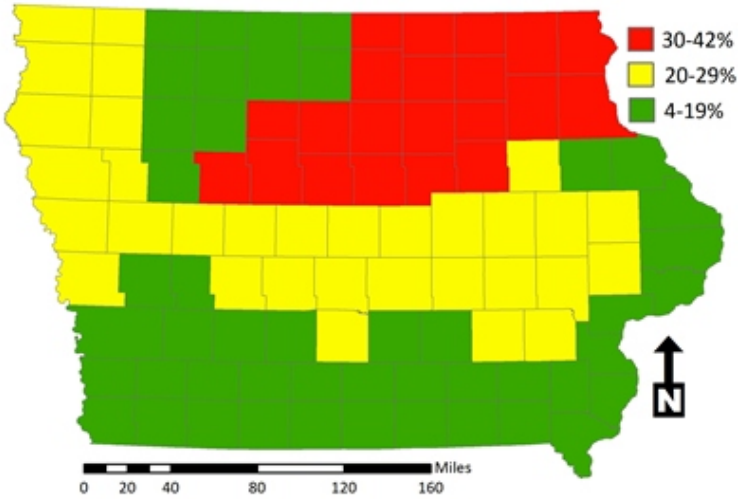

Figure 4. Percent of respondents who suspected a corn rootworm trait failure in at least one of their cornfields in 2012.

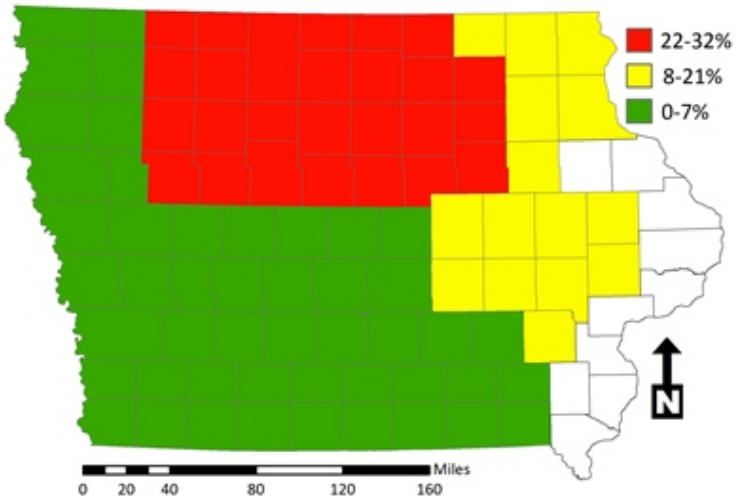

Figure 5. Percent of respondents who positively verified corn rootworm trait failure.

If you find injury to Bt corn on more than one node, consider diversifying pest management for that field. Severe injury may be due to western corn rootworm that has developed Bt resistance, and resistance should be suspected in these cases. The Department of Entomology at Iowa State University is working to understand the extent of resistance within the state and to develop management recommendations for Bt-resistant populations of western corn rootworm. Please contact Aaron Gassmann or Erin Hodgson to report fields with suspected resistance.

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